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ELIMINATION OF CONGENITAL SYPHILIS*

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It has been taught and believed for many years that the routine serological testing of expectant mothers is the key to success in the prevention of congenital syphilis. In England, such routine testing has been used extensively for many years in the antenatal clinics of hospitals and local authorities, and the early booking of expectant mothers at the antenatal clinics occasioned by the increasing demand for hospital confinement should have favoured the discovery of maternal syphilis sufficiently early in pregnancy for antenatal treatment to insure the birth of a non-syphilitic child. In spite of these developments no dramatic reduction in the incidence of congenital syphilis was apparent until about 1952. A previous study (Laird, 1956) of 139 cases of congenital syphilis in children under 5 years of age diagnosed in the 22 venereal disease clinics of the Manchester Regional Hospital Board area during the 5 years 1950-54 inclusive, showed that failure to prevent congenital syphilis occurred for the following reasons:

(1) Some pregnant women, in spite of free facilities, still came to confinement without seeking any antenatal care;

(2) Others, chiefly those confined at home by their general practitioner, received antenatal supervision that did not include a routine blood test;

(3) Maternal infection was recognized too late for treatment to prevent infection of the foetus;

(4) Premature labour significantly reduced the time available for antenatal treatment;

(5) Some infected pregnant women refused, or defaulted from, treatment;

(6) Some pregnant women, in spite of a negative antenatal blood test, produced a child with congenital syphilis;

(7) There was sometimes insufficient liaison between the maternity services and the venereologist.

It was concluded from this study that the routine antenatal blood test, although instrumental in reducing the incidence of congenital syphilis, could not by itself lead to the elimination of this tragic condition. This somewhat pessimistic conclusion was not intended to be used as an argument against routine antenatal serological testing but inspired consideration of the other possible factors involved. The present communication reports this further study.

Present Study

It seems clear from the previous study (Laird, 1956) summarized above that congenital syphilis will continue to occur as long as early syphilis is endemic in the child-bearing population. With the passage of time, however, syphilis in the individual spontaneously becomes non-infectious, although a woman may often remain capable of infecting the foetus long after she has become non-infectious to her sexual partner. If a new generation reaches parenthood free from acquired infection, then congenital syphilis will no longer occur. That we in England may be approaching this happy state for the first time is suggested by examination of the available figures.

It is known that the incidence of early acquired syphilis in England has been greatest at the end of the two world wars and, to a lesser extent, during the years of economic depression about 1930. This is apparent from Table II (below). which shows the

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new cases of acquired syphilis in females *with infections of less than one year* treated in the V.D. clinics of Manchester and of England and Wales from 1931. The year of birth of patients with congenital syphilis seen in the V.D. clinics of Manchester during 1946–56 inclusive (Table I and Fig. 1) shows a similar picture with three periods of high incidence in 1920–23, 1928–32, and 1947–48. These three peaks are probably less prominent than they should be, as the figures do not include infants dying from congenital syphilis or treated in childrens' hospitals, who might otherwise have subsequently been diagnosed in the clinics as examples of late congenital syphilis. The figures (Table II and Fig. 1) for early acquired syphilis in females are of course also minimal, as some infected women show no external signs of syphilis while in others the signs clear up without treatment and without their significance being recognized. Some of the latter group would be discovered subsequently as latent or late cases but would not be included in these figures for early acquired syphilis. This deficiency in the figures would be greatest during the period at the end of the first world war when the V.D. clinic service was in its infancy and when the stigma of venereal disease and the difficulties, especially in rural areas, of reaching a clinic, were much greater than in recent years. Although clinic figures of early acquired syphilis are not available for the years before 1931, it can safely be assumed that such infections were numerous during the latter part of the first world war and the immediate post-war years.

The annual number of cases of congenital syphilis diagnosed in the V.D. clinics of Manchester and of

TABLE I

YEAR OF BIRTH OF CASES OF CONGENITAL SYPHILIS SEEN IN MANCHESTER CLINICS, 1946–1956 INCLUSIVE

Year of Birth	No. of Cases	Year of Birth	No. of Cases
Before 1900	28	1930	32
1900	4	1931	29
1901	5	1932	32
1902	3	1933	20
1903	7	1934	26
1904	8	1935	22
1905	9	1936	23
1906	13	1937	22
1907	11	1938	20
1908	15	1939	15
1909	11	1940	8
1910	21	1941	13
1911	11	1942	14
1912	13	1943	17
1913	13	1944	21
1914	22	1945	11
1915	20	1946	18
1916	23	1947	30
1917	36	1948	24
1918	36	1949	13
1919	36	1950	8
1920	47	1951	8
1921	73	1952	5
1922	37	1953	2
1923	45	1954	1
1924	27	1955	—
1925	29	1956	—
1926	33		
1927	22		
1928	29		
1929	32		

TABLE II

FEMALE CASES OF ACQUIRED SYPHILIS *WITH INFECTIONS OF LESS THAN ONE YEAR*, SEEN IN THE CLINICS OF MANCHESTER AND OF ENGLAND AND WALES, 1929–1956

Year	Manchester	England and Wales	Year	Manchester	England and Wales
1929	310	—	1943	366	4,483
1930	347	—	1944	449	4,934
1931	270	2,683	1945	457	5,527
1932	265	2,532	1946	562	6,970
1933	208	2,141	1947	433	5,416
1934	153	2,030	1948	357	4,034
1935	144	1,745	1949	255	2,420
1936	175	1,642	1950	161	1,465
1937	142	1,647	1951	66	774
1938	134	1,494	1952	24	462
1939	119	1,412	1953	13	319
1940	130	1,582	1954	15	208
1941	201	2,309	1955	12	228
1942	301	3,576	1956	4	257

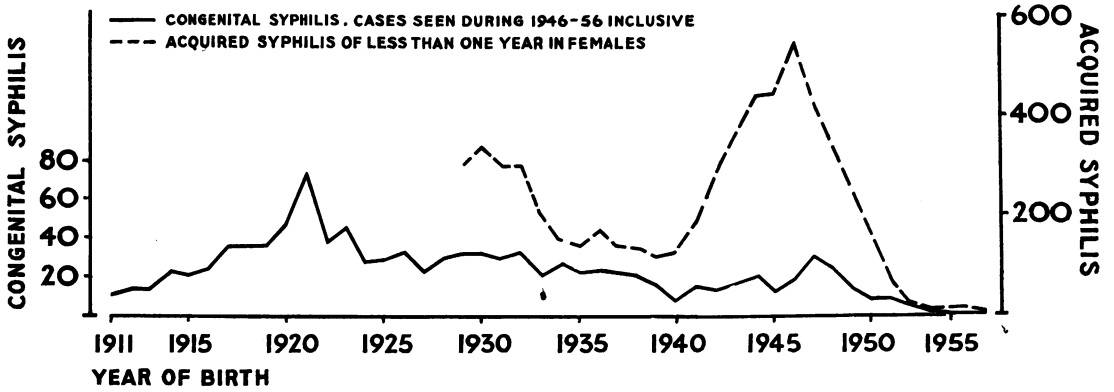

FIG. 1.—Cases of congenital syphilis (and of acquired syphilis of less than one year in females) seen between 1946–56 inclusive, by year of birth.

England and Wales are available from 1931 onwards. The numbers of cases of congenital syphilis under 1 year old (Table III) and of cases aged 1 year and under 5 years (Table IV) show maximum figures related to and following soon after the peak incidence of early acquired syphilis in females (Table II). Figs 2 and 3, based on the figures given in Tables II, III, and IV, show a steady relationship between the numbers for early acquired syphilis in females and those for congenital syphilis. The curve for congenital syphilis under one year lags behind that of early acquired syphilis in females by 1 to

TABLE III

CASES OF CONGENITAL SYPHILIS *UNDER ONE YEAR* SEEN ANNUALLY IN THE CLINICS OF MANCHESTER AND OF ENGLAND AND WALES, 1931–1956

Year	Manchester	England and Wales	Year	Manchester	England and Wales
1931	38	339	1944	24	346
1932	30	302	1945	24	326
1933	36	305	1946	25	363
1934	34	296	1947	38	343
1935	24	251	1948	82	372
1936	32	241	1949	85	355
1937	21	211	1950	17	227
1938	27	216	1951	13	156
1939	23	217	1952	5	110
1940	9	191	1953	0	95
1941	23	223	1954	1	48
1942	21	245	1955	0	41
1943	14	310	1956	0	36

TABLE IV

CASES OF CONGENITAL SYPHILIS, *AGED ONE YEAR AND UNDER 5 YEARS*, SEEN ANNUALLY IN THE CLINICS OF MANCHESTER AND OF ENGLAND AND WALES, 1931–1956

Year	Manchester	England and Wales	Year	Manchester	England and Wales
1931	6	204	1944	8	113
1932	16	180	1945	3	83
1933	3	157	1946	3	103
1934	11	165	1947	3	120
1935	13	165	1948	1	142
1936	6	132	1949	7	118
1937	4	144	1950	9	141
1938	6	123	1951	5	89
1939	6	125	1952	10	101
1940	6	101	1953	5	77
1941	3	90	1954	1	41
1942	11	122	1955	1	30
1943	4	129	1956	1	31

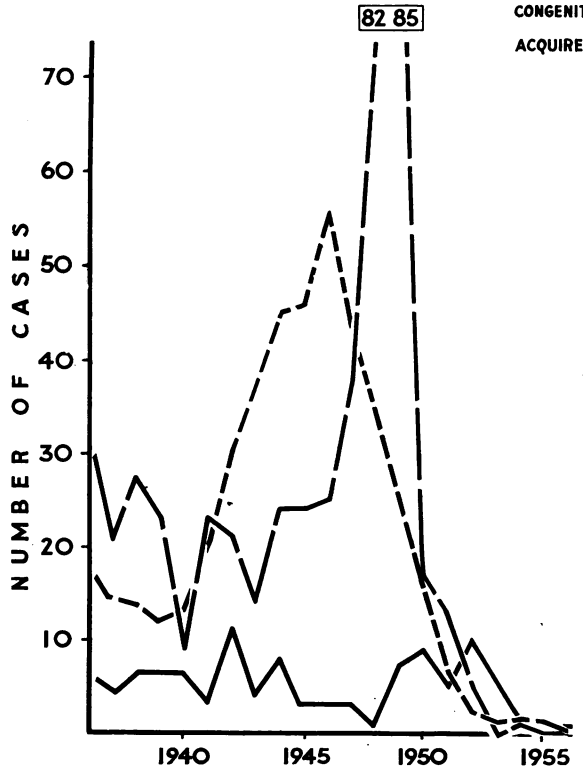

FIG. 2.—Cases of congenital syphilis and of acquired syphilis of less than one year in females, seen in Manchester clinics from 1935 to 1956.

FIG. 3.—Cases of congenital syphilis and of acquired syphilis of less than one year in females, seen in the clinics of England and Wales from 1935 to 1956.

2 years; the curve for congenital syphilis in children aged 1 year but under 5 years also follows that of early acquired syphilis in females but with the appropriate lag period. The curve based on the year of birth of cases of congenital syphilis (Table I) also shows a similar relationship to that of early acquired syphilis (Fig. 1). It appears, therefore, that *during the past 40 years the incidence of early congenital syphilis has followed that of early acquired syphilis in females;* bearing in mind the admitted imperfections of these minimal data, their demonstration of this relationship is considered to be impressive.

While no doubt the absolute number of cases of early congenital syphilis has been considerably reduced by routine antenatal serological testing followed by treatment of the expectant mothers thus discovered, the *relationship* between the incidence of early acquired syphilis in females and the occurrence of early congenital syphilis appears to have been little influenced by such routine testing. Even the more widespread use of antenatal blood tests of increased sensitivity during the past 15 to 20 years has not disturbed the relationship apparent from the Tables during the past 40 years.

In the last few years syphilis has ceased to be endemic in Manchester (Laird, 1957) and only the occasional sporadic case occurs. Table V shows the same trend in the peripheral clinics which serve the smaller towns and rural areas of the area served by the Manchester Regional Hospital Board. This entirely new situation has now become general throughout England with sporadic cases confined almost entirely to the seaports and largest cities. The females exposed to syphilis during the immediate post war years have ceased to be infectious to the foetus either by the passage of time or by treatment. Females reaching childbearing age now and during the past few years have had little if any exposure to acquired syphilis and will not therefore bear infected children. It is not surprising therefore, that during these last few years the numbers of cases of early congenital syphilis has also reached unprecedentedly low levels. However, the *relationship* between early acquired syphilis in females and early congenital syphilis, apparent in the Tables and Figures, over the past 40 years remains undisturbed.

The figures for cases of congenital syphilis aged 15 years and over (Table VI) still show no dramatic decrease similar to that which has occurred with early congenital syphilis. This fact and the above considerations suggest that the factor responsible has only operated in the past 5 years and that this factor must be the disappearance of early syphilis as an endemic infection amongst the population of England. It seems certain that penicillin is chiefly responsible for this epidemiologic development.

TABLE V

PERIPHERAL CLINICS IN AREA OF MANCHESTER REGIONAL HOSPITAL BOARD, 1948–1957

Year	Congenital Syphilis		Female Cases of Acquired Syphilis with Infections of Less than 1 Year
	Under 1 Year	1 Year and Under 5 Years	
1948	34	8	313
1949	25	5	193
1950	21	9	79
1951	13	10	48
1952	12	17	14
1953	10	2	13
1954	7	7	5
1955	1	4	4
1956	2	1	9
1957	0	0	3

TABLE VI

CASES OF CONGENITAL SYPHILIS, *AGED 15 YEARS AND OVER*, SEEN ANNUALLY IN THE V.D. CLINICS OF MANCHESTER AND OF ENGLAND AND WALES, 1936–1957

Year	Manchester	England and Wales
1936	89	935
1937	46	940
1938	52	951
1939	46	866
1940	46	709
1941	24	746
1942	32	788
1943	42	940
1944	34	822
1945	30	736
1946	26	701
1947	29	676
1948	28	678
1949	35	747
1950	53	652
1951	45	684
1952	17	547
1953	24	520
1954	21	478
1955	33	459
1956	49	441
1957	31	—

CONCLUSIONS

The available figures for the past 40 years show that there is a close relationship between the incidence of early acquired syphilis in the female and that of congenital syphilis. This relationship has been little, if any, affected by the routine serological examination of expectant mothers, although the latter practice has materially reduced the absolute number of prenatal infections. Routine serological testing of expectant mothers should still be maintained for some years to discover cases of latent or late syphilis which were infected before syphilis ceased to be endemic; in assessing the results of such testing, increasing attention must be given to the occurrence of biologically false positive reactions. The *elimination* of congenital syphilis cannot be achieved solely by routine antenatal

blood tests, for this practice has been shown to have its failures. Congenital syphilis will only be eliminated when acquired syphilis has ceased to be endemic in the population; in England this happy situation appears to be already in sight.

SUMMARY

There is a close relationship in any population between the incidence of early acquired syphilis in the female and that of congenital syphilis. Routine antenatal serological tests, while reducing the absolute number of cases of congenital infection, appear unable to disturb this relationship, probably because of imperfections which have been previously reported (Laird, 1956). The elimination of congenital syphilis must await the removal of early acquired syphilis as an endemic infection amongst the population; in England this happy situation appears to be in sight.

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